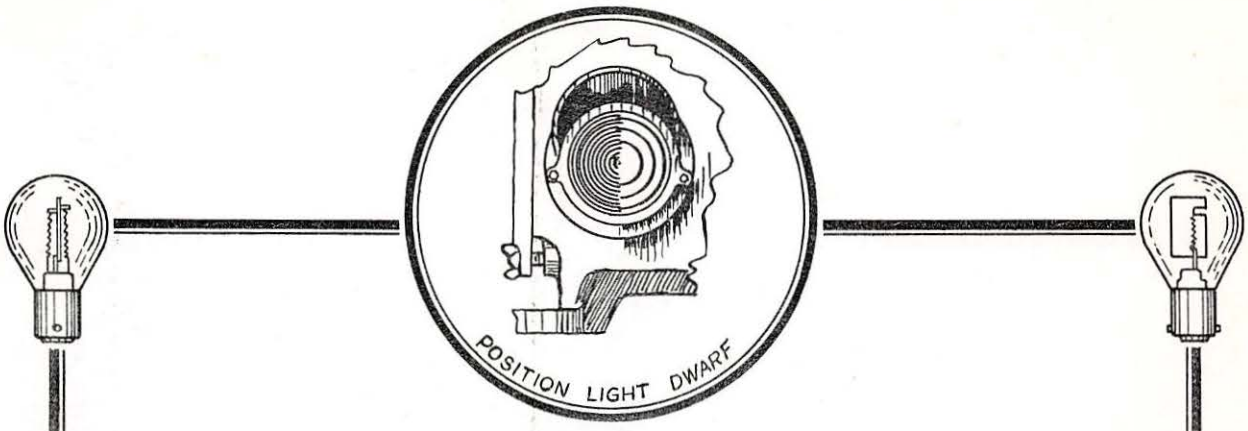

Screened Double Filament Lamps

U·D· 211

Union Switch & Signal Co.
Swissvale, Pa.

Union Switch & Signal Co.

SWISSVALE, PA.

Subject: Screened Double Filament Lamp	Union Development
	Number: 211
See U.D. #210 for Double Filament Lamp without screen	Date: April 1, 1935
* Also Instruction Pamphlet U-5037	Sheets

Development of screened double filament lamps has been carried on over a considerable period of time in cooperation with the Incandescent Lamp Dept. of one of the large lamp manufacturers to determine the most satisfactory and practical arrangement of filaments and screen. Various filament constructions were tested and a design adopted which we believe to be the best possible for railway signaling purposes at the present time.

We view the screened double filament lamp, Fig. 1, as a further extension of the basic ideas present in the recently developed double filament lamps discussed in U.D. #210, since the introduction of the screen between the two filaments is intended to shade a portion of the lens, reflector or coverglass from the secondary filament, and thus provide a more pronounced indication of main filament failure.

The object of the screened lamp is to provide a clear cut indication of failure of a filament and still provide a signal indication bright enough for train operation. When both filaments are burning, the signal presents a full circular beam of light similar in appearance to the beam obtained by the use of a lamp without the screen. When one filament burns out the signal presents an aspect which is semi-circular in shape. One side of the

lens or coverglass in this case is illuminated while the other side is dark. The dark side may appear on either side, or at the top or bottom of the lens or coverglass depending upon the positioning of the lamp in the signal unit.

The screened lamps are being used not only in color light signals but in highway crossing signal units where it is becoming of increasing importance that the standard aspect of two alternately flashing red lights be maintained at all times. The differential in life between the two filaments in the screened lamp provides a certain amount of insurance that the normal aspect of two alternately flashing lights will be maintained, and at the same time, when one filament fails, the presence of the screen in the lamp provides for a definite indication that the lamp should be replaced.

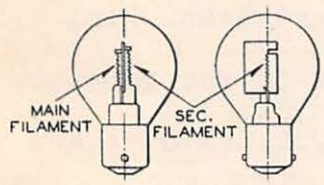

Fig. 1 - Screened Double Filament Lamps (S-11 Bulb)

It is apparent that the use of a main filament and a secondary filament of greater theoretical average rated life greatly increases the probability that the secondary filament will outlast the main filament, thus providing time for discovery, reports and replacement before failure of the remaining filament. This feature has been incorporated in the screened lamp. In order to maintain the normal indication from the signal, symmetrical with respect to the signal axis, the secondary filament consumes slightly more wattage than does the main filament. However, the theoretical average life of the secondary filament is twice that of the main filament. Also, the secondary filament in this lamp contributes the same quantity of light to the normal signal beam as does the main filament.

Actually then, the filament we designate as the secondary is secondary only in that it normally will outlast the main filament in useful life, thus providing the required measure of light-out protection.

It has been noted that, with few exceptions, the railroads do not favor the use of a lamp that consumes power much in excess of 18 watts. The 17-watt rating for the two most used screened lamps available appears best suited to meet requirements. However, there is also available a screened lamp with a total wattage of 11 which is rated at 11 volts. It is our opinion that 17 watts is required in most cases to provide a satisfactory indication where the screened lamp is used.

The screened double filament lamp is available in low wattages only in the S-11 bulb, single contact bayonet candelabra base type. However, adapters are available for use with the screened lamps where it is desired to employ them in sockets designed for re-based lamps.

It is hoped that the three screened lamps available will be satisfactory in all cases where a screened lamp is desired and that it will not be necessary to develop screened lamps of other voltage and wattage ratings.

The following ordering references may be used for the screened lamps that are available.

Pce.No.	Volts	Watts
188049	13.5	M.F. 8 - S.F. 9 - Total 17
188176	10	M.F. 8 - S.F. 9 - Total 17
188550	11	M.F. 5 - S.F. 6 - Total 11

We can furnish sample lamps in small quantities for trial purposes with both filaments connected and with secondary filaments only connected, so that a comparison can be made, by roads that may be interested.

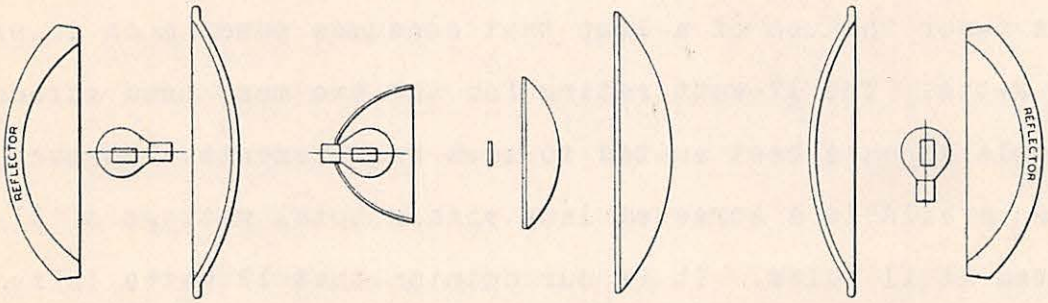

Fig. 2 Fig. 3 Fig. 4

Screen positions where reflectors are used behind lamps

To secure distinctive indications that main filaments have burned out, it is necessary to place lamps in their sockets so that in each case the offset portion of the screen is positioned as illustrated in Figures 2, 3, 4, 5 and 6.

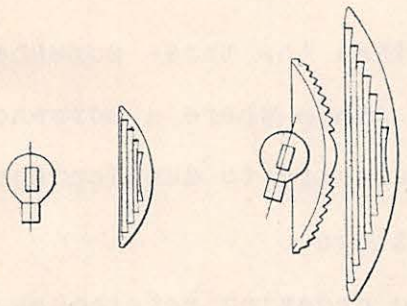

Fig. 5 Fig. 6

Screen positions where there is no reflector.

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